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United States. Bureau of Entomology.

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NEWS LETTER OF THE BUREAU OF ENTOMOLOGY.

U. S. DEPARTMENT OF AGRICULTURE.

Number 11. March, 1915.

NEWS FROM AN ENTOMOLOGIST AT LAKE VICTORIA NYANZA.

A full and entertaining report has recently been received from Mr. W. F. Fiske, who is engaged in the investigation of the tsetse flies (*Glossina* spp.) for the Tropical Disease Commission.

It was written on an unnamed island in Lake Victoria Nyanza on January 10, 1915. At the outbreak of the war Mr. Fiske was called in from the field but later was given authority to visit various islands in the lake.

He reports that the main conclusions at which he arrived before he went to Africa, and which were published in the bulletin of Entomological Research, have been verified, although a great deal of additional information has been obtained. He plans to remain in the vicinity of Victoria Nyanza for the next 14 months. [W. D. HUNTER.]

HAVE ALL FOOD PLANTS ACCURATELY NAMED.

There is a great deal of confusion in the literature of economic entomology on account of inaccuracy and a lack of definiteness in remarks about food plants. Such expressions as "taken feeding upon Rumex sp.," "in wood of Cornus," and so on, occur altogether too frequently.

I had a letter recently from Mr. E. Ernest Green, asking me to find out for him the real names of a very lengthy list of food plants taken from Mrs. Fernald's Catalogue of Described Coccidæ. It took me several weeks before I could straighten the list out, even measurably, for him. The men in the bureau should find it very simple to secure accurate determinations by sending the specimens to Washington, or the nearest agricultural college, and it is hoped that especial care will be taken in this respect in the future. [L. O. HOWARD.]

AN INDEX OF ECONOMIC ENTOMOLOGY.

The index of economic entomology, covering the literature since 1905, is now fairly under way. Two typewriters are engaged in assisting Mr. Nathan Banks in the preparation of the manuscript, and a third will soon be employed. More than one-half of the experiment-station literature has been indexed, and work on the publications of the Bureau of Entomology is nearing completion.

It is estimated that there will be at least 25,000 entries. [N. BANKS.]

RULING OF THE COMPTROLLER OF THE TREASURY DEPARTMENT RELATIVE TO LAUNDRY CHARGES IN EXPENSE ACCOUNTS.

On October 5, 1914, the Comptroller of the Treasury Department rendered another decision relative to laundry, in which he stated in part as follows:

I have in several decisions expressed my personal disapproval of the inclusion of such items in travel expenses to be paid by the Government * * *, holding that they are to be charged, however, against the allowance for subsistence.

The general rule which must ordinarily be followed in charging items of this character is that they must be charged as subsistence for the day on which they are paid. This is founded on the theory that they are usually paid on the day

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when they accrue and when the bills therefor are presented. Expenses of this kind are not authorized to be prorated for the entire period covered by the travel.

They must ordinarily be considered as being incurred on the day when paid, but when several accrued charges are paid on one day * * * they may be regarded as expense of the days on which severally accrued.

For example, a charge of $2 for accumulated laundry, paid on a given date, would leave but $3 subsistence (meals, lodgings, tips, etc.) for that particular day.

The agents and field men are requested to exercise care in the preparation of their accounts with relation to the above decision, since it has been necessary in several cases to disallow excess subsistence in the nature of laundry expenses. [L. O. HOWARD.]

SOME NOTES ON THE PREPARATION OF ACCOUNTS.

That the frequent return for correction of accounts to men in the field may be eliminated, and the number of suspensions be reduced to a minimum, it would probably be well to invite attention to some minor details of form, the importance of which often does not impress the agent.

The face of voucher, upper left-hand corner, provides a space in which should be written the official station and temporary station, if assigned.

Each account should begin with a statement showing the location of the traveler, if he is not at his official station at the beginning of the period for which the account is submitted.

Every locality indicated should mention the State, and each change of locality should be supported by naming the means of conveyance. If by railroad, show the initials of the road. (See par. 89(f), Fiscal Regulations.) In this connection be sure to state the fact if a change of locality is made by means of conveyance for which no charge is made or if made on foot.

Paragraph 67, Fiscal Regulations, provides that specific written authorization should be secured before travel is performed. When travel is performed (see par. 89(d)), state starting point, day and hour of arrival and departure from station, points visited, and means of conveyance. All expenses charged must show the locality at which the expense was incurred.

Indicate on the back of the account every transportation request used.

Prepare statement of all mileage or scrip used in duplicate on forms furnished for the purpose. (See pars. 84 to 88, Fiscal Regulations.)

For the proper form of rendering reimbursement account, see pages 48–49, Fisca Regulations.

Whenever official travel is interrupted for the purpose of taking leave, the day and hour of beginning such leave should be stated, and also the day and hour of resuming official work. If official work is resumed at a point other than that at which such leave began, no greater charge for subsistence and travel may be allowed than might have been allowed in reaching such point from the point at which official work was acquitted. [O. F. B.]

(To be continued in the April number.)

NEW BOOKS IN LIBRARY.

American fruits yearbook and directory of nurserymen. 1915.

American museum of natural history. Bulletin, vol. 33, 1914.

p. 1–63. Wheeler, W. M., and Mann, W. M The ants of Haiti.

p. 391–493. Leng, Charles, and Mutchler, A. J. A preliminary list of the Coleoptera of the West Indies as recorded to Jan. 1, 1914.

p. 495–535. Barber, H. G. Insects of Florida, II. Hemiptera.

Fox, Carroll. Some new Siphonaptera. A further report on some Siphonaptera from the Philippine Islands. The taxonomic value of the copulatory organs of the females in the order Siphonaptera. Washington, 1914. 31 p. 22 pl. (U. S. Public Health Service. Hygienic Laboratory Bulletin 97.)

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Hindle, Edward. Flies in relation to disease; bloodsucking flies. Cambridge, 1914. 398 p. illus. (Cambridge public health series under the editorship of G. S. Graham Smith and J. E. Purvis.) References at ends of sections.

Hood, J. D. An outline of the subfamilies and higher groups of the insect order Thysanoptera. (Proceedings of the Biological Society of Washington, v. 28, p. 3–60, Mar. 12, 1915.)

Hutchinson, W. Z. Advanced bee culture; its methods and management. The A. I. Root Co., Medina, Ohio. 1911. ed. 4. 205 p.

Kraemer, Henry. Applied and economic botany, especially adapted for the use of students in technical schools, agricultural, pharmaceutical, and medical colleges, and also as a book of reference for chemists, food analysts, and students engaged in the morphological and physiological study of plants. 806 p. 424 pl. Philadelphia. The author, 1914.

The library of the Department of Agriculture has recently received by transfer from the Library of Congress a number of volumes on apiculture, among them a first edition (1853) of "Langstroth on the hive and honey bee." Northampton, Hopkins, Bridgman & Co. These books are filed with the Apicultural Division at Drummond.

NEW PUBLICATIONS.

Farmers' Bulletin No. 650, The San Jose scale and its control, by A. L. Quaintance, was issued March 30, 1915.

Farmers' Bulletin No. 658, Cockroaches, by C. L. Marlatt, was issued March 27, 1915.

Report of the Secretary's Office No. 101, entitled "The Woolly Apple Aphis," by A. L. Quaintance and A. C. Baker, was issued March 31, 1915.

The Contents and Index number of the two papers on Aphididæ, known as Technical Series 25, has gone to press.

Bureau Bulletin 94, Part II, Biology of the termites of the eastern United States, with preventive and remedial measures, by Thomas E. Snyder. Issued February 17, 1915.

Department Bulletin 197, Home-made lime-sulphur concentrate, by E. W. Scott. Issued March 31, 1915.

BEE-CULTURE INVESTIGATIONS.

E. F. PHILLIPS, *In charge.*

In conjunction with the Southern Conference for Education and Industry, to be held at Chattanooga, Tenn., April 27–30, there will be a conference of southern bee keepers. The meeting on the first day will be devoted to a discussion of beekeeping for teachers and others interested in the development of beekeeping in the South. The Tennessee State Beekeepers' Association has called a special meeting to be held with this conference on April 28–29. E. F. Phillips is chairman of the bee-keepers' conference.

N. E. McIndoo will leave about April 1 for Roswell, N. Mex., and Grand Junction, Colo., to do work in cooperation with the Office of Deciduous Fruit Insect Investigations. Mr. George S. Demuth will go to Winchester, Va., for similar work on a later date.

The taking of records for the investigations on wintering will be discontinued about March 31. The lateness of the season has made it necessary to continue this work longer than usual.

CEREAL AND FORAGE INSECT INVESTIGATIONS.

F. M. WEBSTER, *In charge.*

Mr. Irving R. Crawford has been appointed temporary field assistant, and will proceed to San Diego, Cal. to collect parasites of a species of *Hemileuca oliviæ* in northeastern New Mexico. The force engaged upon this investigation will consist of Mr. D. J. Caffrey, in charge; Messrs. Crawford and J. R. Sandige, temporary assistants; and a permanent appointee not yet selected.

Mr. Timberlake, who has been spending the winter at the Brownsville, Tex., laboratory, engaged particularly on the hymenopterous parasites of lady beetles, will return to Salt Lake about the middle of April, and on his return Mr. L. P. Rockwood will be transferred temporarily to Forest Grove, Oreg., to assist in the clover-insect investigations being carried on at and from that laboratory.

Mr. Harrison E. Smith is settled in the new laboratory established at West Springfield, Mass., and will confine his work chiefly to New England.

Mr. J. J. Davis, in charge of the laboratory at Lafayette, Ind., is making an extended southern trip, establishing some cooperative investigations in Lachnosterna at Auburn, Ala.; College Station, Tex., and other points.

DECIDUOUS FRUIT INSECT INVESTIGATIONS.

A. L. Quaintance, *In charge.*

Mr. John B. Gill has returned to his field station at Monticello, Fla., where he will continue investigations in connection with pecan insects.

Mr. E. B. Blakeslee has returned to his headquarters at Winchester, Va., and will continue his studies of certain insects injurious to the peach.

Mr. B. R. Leach will also make Winchester, Va., his headquarters as last year. His work on the woolly apple aphis as planned for the present season requires a good deal of travel in the Shenandoah Valley and neighboring regions.

Mr. E. H. Siegler, formerly in charge of the laboratory at Benton Harbor, Mich., in connection with the project of insecticide investigations, has been placed in immediate charge of the laboratory at Grand Junction, Colo., where, in cooperation with the Colorado Agricultural Experiment Station, he will undertake a thoroughgoing investigation of the codling moth in the Grand Valley. He will be assisted by Mr. E. R. Van Leeuwen.

The laboratory in Maine has been discontinued. Mr. F. L. Simanton, formerly in charge, has been transferred to the laboratory at Benton Harbor, Mich., where he will undertake investigations in connection with orchard insecticides and spraying machinery. He will be assisted by Mr. H. G. Ingerson.

Mr. E. W. Geyer, who spent several weeks in Washington during the winter in connection with the preparation of reports, has returned to his headquarters, Roswell, N. Mex., where further experiments will be made in the control of the codling moth under arid conditions, including an extensive series of dusting experiments.

Mr. R. J. Fiske will assist Mr. Geyer in the New Mexico work.

Mr. W. M. Davidson has returned to his headquarters, Walnut Creek, Cal., where he will continue his investigations in connection with the grape Phylloxera. During his stay in Washington the report on the biology of this insect was about completed, and another season's observations will complete the subject in a satisfactory manner.

Mr. H. K. Plank has returned to his headquarters at Pemberton, N. J., where he will assist Mr. H. B. Scammell in connection with cranberry-insect investigations.

Mr. A. C. Baker has returned to Vienna, Va., where he will continue his investigations in connection with apple-plant lice.

Mr. A. J. Ackerman has returned to his headquarters at West Chester, Pa., where he will continue investigations of nursery insects.

FOREST INSECT INVESTIGATIONS.

A. D. Hopkins, *In charge.*

Dr. Hopkins left Washington on March 6 for the purpose of visiting the series of forest insect field stations in the West and addressing the third conference of national park superintendents and supervisors which met at Berkeley and San Francisco, Cal., on March 11–13, 1915. He has just returned. The field stations he visited included Colorado Springs, Colo.; Placer-

ville, Cal.; Ashland, Oreg.; and Missoula, Mont. On March 13 he addressed the conference on the subject of "Insect Depredations in the National Parks and How to Prevent Them." Arrangements were also made at this conference with representatives of the Interior Department to train selected men for the different national parks in the practical details of forest insect control and prevention. According to this arrangement national park representatives will be detailed to the Bureau of Entomology to work under immediate instructions of an entomological ranger trained as an insect-control expert.

Entomological Ranger W. G. Glendinning, attached to the field station at Placerville, Cal., spent about two weeks in Washington this month in consultation on practical details pertaining to demonstration and control work in cooperation with the Forest Service.

Mr. H. G. Champion, the Carnegie scholar, as previously announced, left Washington on March 14 and joined Dr. Hopkins at Missoula, Mont. He will spend the summer in the study and observation at the various stations, returning to Washington in the fall.

PREVENTING SPREAD OF MOTHS.

A. F. Burgess, *In charge.*

CONFERENCE OF OFFICIALS ENGAGED IN GIPSY MOTH WORK.

On February 13, 1915, a conference of officials engaged in gipsy moth work was held at the Boston office of the Bureau of Entomology for the purpose of discussing gipsy moth conditions in order to secure as much uniformity of work and general cooperation as possible among those engaged in this project.

Dr. L. O. Howard, Chief of the Bureau of Entomology, presided at the meeting and the following officials and visitors were present:

Dr. C. Gordon Hewitt, Dominion Entomologist, Ottawa, Canada.
Mr. L. S. McLaine, Assistant in Gipsy and Brown-tail Moth Work, Ottawa, Canada.
Hon. W. T. Guptill, Commissioner of Agriculture, Augusta, Me.
Mr. E. J. Cady, Special Agent in Charge of Gipsy Moth Work, Portland, Me.
Hon. A. L. Felker, Commissioner of Agriculture, Concord, N. H.
Prof. W. C. O'Kane, Deputy Commissioner, In Charge of Moth Work, Durham, N. H.
Mr. Harold L. Bailey, In Charge of Suppression of Insect Pests, Bradford, Vt.
Dr. H. T. Fernald, State Inspector of Nurseries, Amherst, Mass.
Prof. A. E. Stene, State Entomologist, Kingston, R. I.
Mr. C. W. Loveland, Assistant Entomologist, Providence, R. I.
Dr. W. E. Britton, State Entomologist, New Haven, Conn.
Mr. I. W. Davis, Assistant Entomologist, New Haven, Conn.
Dr. T. J. Headlee, State Entomologist, New Brunswick, N. J.
Mr. Philip B. Ayers, Secretary of Society for the Protection of New Hampshire Forests, Boston, Mass.
Mr. E. L. Reynolds, Secretary of Massachusetts Forestry Association, Boston, Mass.
Mr. C. B. Williams, Mr. Ernest Hargreaves, and Mr. George H. Corbett, Carnegie scholars, who are studying problems in economic entomology in this country, and a number of representatives of the Bureau of Entomology engaged in all different lines of investigation and field work which are being carried on in connection with the gipsy moth project.

Other officials having charge of moth work in Massachusetts, New York, and Ohio were not able to be present at the meeting.

The meeting was called to order by Dr. Howard and a statement was given by representatives from each State and the Dominion of Canada concerning the existing conditions and the methods which were being used to control both the gipsy and brown-tail moths.

This was followed by a brief statement by Dr. Howard, in which he indicated that Federal work on these two insects had been brought about largely because of the fact that the States infested were attempting to control these insects. He further stated that there seemed to be

little disposition on the part of Congress to discontinue appropriations so long as it could be shown that the States were doing their part in stamping out these pests.

Statements were then made by members of the Federal gipsy-moth force in regard to the different lines of work which were being carried on and the results which have been accomplished.

The parasite and other experimental work was briefly outlined by the writer, and the silvicultural work, scouting work, and quarantine work, were discussed by Messrs. Clement, Worthley, and Rogers.

At the afternoon session a general discussion was taken up in regard to the desirability of more uniform legislation in the different States and suggestions were made relative to changing some features of existing laws so as to bring about better results. Sufficient time was available, so that different men in attendance had an opportunity to discuss features of the work with which they were most interested, and it was the opinion of those present that much benefit and a better understanding of conditions in different parts of the infested territory would result.

During the conference it was brought out that a change in the gipsy moth quarantine regulations was pending and that the Federal Horticultural Board expected to permit the shipment of Christmas trees and Christmas greens in the fall of 1915 after they had been inspected. The present regulations do not permit the shipment of material of this sort outside the area under quarantine for the gipsy moth. It was the opinion of those present that Christmas trees and greens could not be satisfactorily inspected, owing to the large amount of material which is moved in a short period of time.

On motion of Dr. Hewitt, the thanks of the meeting were extended to Dr. Howard and the writer for calling the meeting and it was voted to hold a similar meeting next winter.

SOUTHERN FIELD CROP INSECT INVESTIGATIONS.

W. D. Hunter, *In charge.*

B. R. Coad has been placed in charge of the boll-weevil laboratory at Tallulah, La. G. D. Smith, formerly at this station, has been located at Thomasville, Ga., where he will conduct studies of a number of cotton pests.

T. C. Barber recently of the experiment station at Tucuman, Argentina, has been engaged as an agent attached to the Tallulah laboratory.

D. L. Van Dine has returned to his field station at Mound, La., for the summer.

A. H. Jennings, who has been engaged for some time in the study of the possible transmission of pellagra by insects, will be detailed to the investigation of malarial mosquitoes. After the 1st of May he will be located at Mound, La.

In January, W. V. King received a degree of doctor of philosophy from Tulane University at New Orleans.

During the month a conference regarding the plans for boll-weevil work was held at Tallulah and W. D. Hunter and A. C. Morgan attended the conference. Both of these men later visited the laboratory at Audubon Park, New Orleans.

Messrs. R. W. Wells, M. J. Stanley, and G. H. Cowan have been appointed in connection with the spotted-fever tick work in Montana.

SUGGESTIONS TO FIELD MEN ON THE PREVENTION OF MALARIA INFECTION.

D. L. Van Dine, *Southern Field Crop Insect Investigations.*

The men of the bureau engaged in the work relating to the malaria mosquitoes have spent two seasons in a region where malaria is widely prevalent without a single case of the disease developing in any member of the party. Since the nature of this work subjects the men engaged

upon it to daily contact with the malaria mosquitoes, it can be assumed that these men encounter the maximum difficulty in avoiding infection. The fact that infection was prevented without any important personal inconvenience or serious interference with the field work has led to the idea that suggestions on "how to avoid contracting malaria" would be of interest to the field men of the bureau and others whose work necessitates spending all or a portion of the season in regions where malaria occurs.

Malaria is not confined to any particular regions of the United States. It is more prevalent in some regions than in others, but it may occur in any locality where suitable conditions exist for the development of the particular species of mosquitoes which act as the conveying agents. It is to be suspected in any rural region during the season of higher temperatures where collections of surface water occur in any extent.

When going to a new field station, or returning to a former station if the question has not been considered previously, a field worker should consult some well-informed physician of the region as to the prevalence of malaria in that region. It is important to determine the foci of the disease, the types of the disease, and the seasonal rate of the disease that obtain for that particular region. This information will enable the person to avoid unnecessary exposure in those localities where the disease is more prevalent, to recognize the disease from the symptoms, and to know the seasons when particular care should be taken. The centers of infection should be avoided in the selection of living quarters and laboratory room.

If the disease is contracted, it should be remembered that it is not a dangerous malady to combat under proper treatment but it is important to have the services of a well-informed physician. The most important point is the diagnosis. Many derangements of the system, aside from an infection of the malaria parasite, produce a chill, and very often a person experiencing a chill when located in a region where malaria is prevalent is apt to diagnose his own case and pronounce it malaria. Very often under the impression that the disease has been contracted, or as a preventive, a more or less continued and irregular use of quinine is begun, which is seldom of benefit. Under no treatment at all the chronic type of the disease is apt to develop, and so it is important to learn as early as possible, if any of the symptoms of malaria develop, whether or not it is really malaria. The finding of the organism in the blood is the proper method of diagnosis. The physician will advise the proper treatment as to laxatives, quinine, and diet. There is one important point that it would be well to mention. The physician will always advise but the patient will seldom take several days of complete rest after the malarial attack has been arrested. The impulse is to be up and about after the active symptoms of the disease have disappeared. The course of quinine should be continued after the chills cease, to obtain complete sterilization of the blood, and rest also is of decided assistance.

A primary requisite in avoiding an infection of malaria is a clear understanding of the nature of the disease, of the causative organism, of the manner of its transmission, and of the mosquitoes that are the vectors. There are several publications of the Bureau of Entomology which provide this information. Bulletins 78 and 88 give the foundation of the subject. A special discussion of malaria is found in Farmers' Bulletin 450, which also figures the malaria mosquitoes. A more concise arrangement of Bulletin 88 is found in Farmers' Bulletin 444.

In a malaria region the living quarters and the laboratory room should be properly screened with wire cloth. During the season when mosquitoes are active a person should always sleep under a mosquito bar or bed net, irrespective of whether the house or room is screened or not. If the house is screened already, attention should be given to its condition and to the size of the mesh. Not less than a No. 16 mesh should be used. The dealers do not carry this size mesh as a rule, but it should be insisted upon, as it can always be secured by them from any

of the wire-cloth manufacturers. If the wire is in place and in good condition, it will be found difficult to induce the landlord to change from a 14 or 12 mesh to 16. The 12 mesh should be changed but the 14 can be made effective in turning mosquitoes by the application of a coat of paint. The paint should be thinned for this use or otherwise it will fill many of the openings entirely and needlessly cut down the circulation of air. The composition of the wire depends upon the location. In the dryer atmospheres, and especially inland locations, a good grade of galvanized-iron wire will last for several seasons. It usually pays to purchase one of the higher grade nonrusting wire cloths.

The screen doors should open outward, should be hung with spring hinges, should be fitted with a spring lock, and should fit closely all around the door opening. As wide a margin of contact with the door casing as possible should be provided. This requires a fairly heavy, well-braced door frame. The window screens are most efficient when the wire cloth is placed on frames to cover the entire window opening and fastened snug to the window casing on the outside with hooks and eyes or with screws which permits their being removed for repair or for cleaning the windows. The windows may be raised or lowered from the inside. If the living quarters have a gallery or veranda, the same should be screened in, which may be accomplished by placing uprights between the gallery posts to suit the width of the wire cloth. This extra cost of screening the gallery is offset by the saving in not screening the door and window openings leading onto the veranda and by the added protection in possessing an out-of-doors room for use during the warm summer season. During the season when fires are not a necessity, the flues of the fireplaces should be screened by covering the top of the chimney with wire cloth, held in place by an extra course of loose bricks. This is an important point which is frequently overlooked.

To prevent as far as possible mosquitoes seeking shelter around and beneath the living quarters or laboratory, the building should be raised well off the ground to permit free entrance of light and air beneath. Tall grass, weeds, and undergrowth should be kept down for a liberal space about the building.

Each bed should be provided with a mosquito bar. There are several kinds of material on the market for use as mosquito bars, but the cheaper materials not only vary in the size of the mesh but pull apart in use, allowing the mosquitoes entrance to the bar. The cheaper materials having an irregular mesh are sold under the name of "mosquito bar." That sold under the trade name of "bobinet" has a regular mesh and is the most durable and the most efficient. While the first cost is greater, considering its longer wear and the protection it affords, the bobinet is the more economical. Bobinet is manufactured in widths from 72 inches to 90 inches and above and in three size meshes—fine, medium, and large. The fine-mesh bobinet excludes the greater amount of air and the large mesh allows entrance to a certain proportion of the unfed mosquitoes seeking a blood meal. The medium size mesh bobinet is, therefore, the most desirable. An efficient bar can be constructed by gathering the bobinet liberally to a piece of muslin (usually sold under the trade name of "domestic") about 3 feet by 5 feet in size. A wooden frame of light material may be constructed the same width and length as the muslin and hung lengthwise over the bed from the ceiling by means of cords. The bar is held to the frame by tape sewed to the margins and to the corners of the muslin. The bar can be constructed circular as well as rectangular and hung to a wooden or wire hoop. The frames on the market for supporting mosquito bars over beds are usually circular, though the rectangular bar is the more roomy. The length of the mosquito bar must be sufficient to allow for a liberal air space over the bed and for folding beneath the edges of the mattress at the bottom. The 90-inch bobinet provides a liberal length and 10 yards gathered to the muslin

will make a roomy bar for a double bed. The 90-inch, medium-mesh bobinet should retail for from 30 to 35 cents a yard, depending upon the quality.

The mosquito bar should be drawn about the bed before nightfall and should be tucked beneath the mattress inside the head and foot boards. Care should be taken that no mosquitoes are inclosed in the process. Then mosquitoes resting beneath the bed can not find an entrance to the inside of the bar.

With attention to screening the living quarters and the laboratory and providing an efficient bar over the bed, the danger of exposure to infection will depend upon the care taken in entering and leaving the house, in the places visited after nightfall, and especially upon the protection found when spending the night away from headquarters. When traveling, a field man may carry a mosquito bar with him to good advantage. The size of the bar for use in travel can be greatly reduced from that given for use at headquarters. Eight yards of the 72-inch bobinet gathered to a smaller piece of muslin will make a practical bar. The weight is not an item, as the bar adds little to the luggage to be carried. The frame is not important. Two light strips of wood crossed in the middle and reaching from corner to corner of the muslin and hung by the middle with a cord to a small hook in the ceiling can be used, or extra lengths of tape can be sewed to the corners of the muslin and used to hold the bar over one's bed by attachment to the head and foot boards, backs of chairs, light fixtures, or fastened to the walls with small tacks. If a bar is not carried by the traveler he should by all means have in his bag a needle and thread for use in repairing the nets he finds in the hotels.

If mosquitoes make their way into the screened house through carelessness of servants or otherwise, they should be searched for and killed. If the covering of the walls is of a light color, the mosquitoes are more readily observed.

In riding after nightfall, especially in buggies or in autos, a person is liable to exposure from the mosquitoes resting in the vehicles, the attack being usually about the ankles. For this reason, and on general principles, it is best to wear high-top shoes during the summer season in a malarial region.

In some cases the circumstances may make it necessary to depend upon repellents. A number of these are described in the bulletins referred to earlier.

Frequently Anopheles mosquitoes make their way into sleeping cars when they are opened for cleaning and are imprisoned when the screens are lowered. Throughout the season when Anopheles are active it is a good plan to turn on the berth lights before retiring and find and destroy any mosquitoes that may be present.

It will probably be impractical for field men to attempt the prevention of the breeding of mosquitoes over any wide area in the region in which they are located, but often a great deal can be done and relief secured by attention to the breeding places in the immediate vicinity of the living quarters or laboratory.

TROPICAL AND SUBTROPICAL INSECT INVESTIGATIONS.

C. L. Marlatt, *In charge.*

Dr. E. A. Back and Mr. C. E. Pemberton are hoping to practically complete their research work on the Mediterranean fruit fly (*Ceratitis capitata* Wied.) in Hawaii by June 30. A good deal of time has been spent this spring studying the fruit-fly conditions, especially from the standpoint of temperature, at different elevations on the island of Hawaii, where a total elevation of 14,000 feet above sea-level is reached. In connection with this study other insects damaging coffee in this district have been investigated. It will be interesting to members of the Bureau of Entomology to know that one of the fruit-fly parasites introduced by Dr. Silvestri, working

under the auspices of the Territorial board of agriculture, has been extraordinarily successful. This species, *Opius humilis*, on the authority of Dr. Back, has already caused a considerable decrease in fly abundance in Honolulu, and particularly in the Kona coffee district on the island of Hawaii. The parasitism among larvæ developing in coffee berries is sometimes nearly complete, the records often ranging about 80 per cent. The parasitism of the larvæ of the fruit fly in other host fruits varies from 0 to 100 per cent, and involves a very considerable list of host fruits. This is, therefore, another apparently very successful parasite introduction in Hawaii, where so many previous successes have already been recorded.

Mr. J. R. Horton, in charge of the Louisiana citrus work, made a visit of two weeks to Washington and worked up reports and matured plans for the continuation of work at his station.

Mr. E. W. Rust, assistant in the inspection work of the Federal Horticultural Board, is now in California on leave for the purpose of taking a civil-service examination.

Mr. E. R. Sasscer, of the same service, is about to become the possessor of a sterilizer made for can sterilization for use in canneries, which is being provided by the Federal Horticultural Board for fumigation in partial vacuum of much larger quantities of material than has hitherto been possible. The first test with this apparatus will be the fumigation of an entire bale of Egyptian cotton to determine the depth of destructive penetration of the gas in relation to the pink boll worm. The Department of Agriculture will probably shortly issue orders and regulations governing the entry and utilization of foreign lint cottons to protect the United States from the pink boll worm, which is very apt to enter with the seed which is left in such cotton on account of faulty ginning.

TRUCK CROP AND STORED PRODUCT INSECT INVESTIGATIONS.

F. H. Chittenden, *In charge.*

Mr. F. A. Johnston, entomological assistant, has closed his office at Riverhead, N. Y., and will take up work on truck-crop insects, especially the pea aphis and root maggots, at Hart, Mich.

Mr. H. O. Marsh, scientific assistant, has returned after a short trip to Arizona, to his regular headquarters at Rocky Ford, Colo., where he will resume work on sugar beet and truck crop insects.

Mr. Frank R. Cole has been appointed scientific assistant, to work temporarily at Pasadena, Cal., and vicinity.

Mr. F. M. Wadley, of Manhattan, Kans., will return to Garden City, Kans., where he will assist Mr. F. B. Milliken in work on sugar beet and truck crop insects.

Mr. C. E. Smith has been engaged to assist Mr. Thomas H. Jones in work on truck crop insects at Baton Rouge, La., and vicinity.

Mr. Neale F. Howard, a graduate of the agricultural college, University of Wisconsin, will work with this branch of the bureau on the pea aphis, root maggots, and other insects affecting truck crops, with headquarters at Green Bay, Wis., in cooperation with the University of Wisconsin.

Mr. C. H. Popenoe has recently returned from Texas, where the new self-propelled onion sprayer was being tested. It was found that the operation of the machine in onion fields was quite successful and certain slight modifications as to tire width, etc., will render the machine somewhat more effective. This machine will also be tested by Mr. M. M. High against the melon aphis at Mission, Tex., since it is believed that through the pressure obtainable in a machine of this character the aphis may be readily controlled. The machine has proven to be applicable to the control of many truck-crop pests other than those on the onion.

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